

SEAT No. _____

No. of Printed Pages : 2

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SARDAR PATEL UNIVERSITY
B.Sc. (V SEMESTER)- INSTRUMENTATION (V) EXAMINATION
23rd December, 2020
US05CINV24: ANALYTICAL INSTRUMENTATION

TIME:- 2:00 pm to 4:00 pm

MARKS-70

Q-1 Choose correct answer

[10]

1. If identical solutions are placed inside & outside the bulb of glass electrode, there exists an EMF of few mV is called as
(a) Symmetric potential (b) Asymmetry potential (c) equilibrium (d) none
2. pH measurement is based on equation.
(a) Ohm's (b) Faraday's (c) Nernst's (d) Galvani's
3. The variation of is proportional quantity to pH.
(a) current (b) resistance (c) inductance (d) potential
4. Injection valve method is used for
(a) detecting (b) sampling (c) heating (d) recording
5. If the mobile phase is liquid and stationary phase is also liquid the type is.....chromatography
(a) absorption (b) partition (c) ion exchange (d) gel
6. is made in the form of U or helix in chromatography,
(a) column (b) carrier gas (c) detector (d) oven
7. HPLC system utilizes....., which smoothens the high pressure pump pulsations.
(a) Resistivity (b) hydraulic capacitor (c) pneumatic induction (d) none
8. If the sample's molecular weight is greater than 2000 than method selected for LC is
(a) water soluble (b) ionic (c) non ionic (d) acidic
9. In which detector, after nebulization, the atomized solvent spray passes rapidly down the evaporator.
(a) Thermal detector (b) Mass detector (c) Fluorescence (d) Conductivity
10. Snell's law is used in detector.
(a) Thermal (b) Fluorescence (c) Conductivity (d) Refractive Index

Q-2 Fill in the blanks

[8]

1. Heart of chromatography is
2. Electron capture detector is especially used for
3. Full form of HPLC is.....
4. Better analysis of pharmaceutical products is carried out by detector.

State True or False

5. Packed column has higher diameter and is commonly used for general applications.
6. Properties of carrier gas includes: impurity and non inertness.
7. High energies of laser can cause thermal distortions & sensitivity can decrease due to scattering at the optical sections of the system.
8. Capacitor act as memory capacitor in chopper amplifier type pH meter.

[1]

(P.T.O.)

Q-3 Short answer type question. (attempt any 10)

[20]

1. Why pH 7 is considered as neutral?
2. Enlist different types of pH meter.
3. Explain in brief Hydrogen Electrode.
4. Draw neat labelled diagram of Reference electrode.
5. What are precautions for sample injection in Chromatography?
6. Draw neat diagram of Syringe Injector for Liquid Chromatography.
7. What do understand by Ion exchange Chromatography?
8. With diagram of Combination electrode explain in brief.
9. What do you understand by Gradient Elution?
10. Enlist requirements for detectors.
11. Give the examples of Bulk property and Solute property detectors.
12. List different types of Laser detectors.

Q-4 Descriptive type (attempt any 4)

[32]

1. Draw labelled diagram of glass electrode and explain it in detail. What are the precautions to handle glass electrode?
2. Write design consideration of pH meter and explain Chopper Amplifier type pH meter.
3. What are design considerations of Column Oven? Discuss Temperature control circuit of Oven in Gas Chromatography.
4. Discuss different types of column used in Gas chromatography.
5. What is HPLC system? Describe its flow measurement and control.
6. Discuss Reciprocating Piston pump and Syringe type pump used in LC.
7. Describe working of Mass detector and Fluorescence detector.
8. Explain working of UV absorbance detector and Refractive Index detector.

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